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small size and low power consumption are important in the hardware implementations of such communication systems, custom integrated circuit solutions are important to achieving these goals.

Page 9, eighth paragraph, lines 26-34 through page 10, lines 3-4, amend to read as follows:

DETAILED DESCRIPTION OF THE INVENTION

AJ

The present invention is directed to digital data communication systems and methods for operating such systems in order to synchronize a receiver's timebase to a remote transmitter's. Carrier frequency and symbol timing information are recovered from a pilot (unsuppressed carrier) signal that is inserted into a VSB spectrum, in contrast to conventional timing recovery systems, which recover timing information from the segment sync signal that is provided at the end of every line of 828 symbols, and is specifically designed to facilitate timing recovery.

Page 20, third paragraph, lines 17-28, amend to read as follows:

Ins B57
A3

In-phase (I) and quadrature phase (Q) baseband signals are then filtered by square-root Nyquist filters 22 which can accommodate roll-off factors of 11-18%. The outputs of the square-root Nyquist filters are subsequently directed to an adaptive equalization block 24 and are parallel-processed by a Nyquist-type prefilter 26 to provide an input signal to an acquisition/tracking loop circuit 30 which includes carrier recovery loop circuitry to support carrier frequency recovery and spectrum centering as well as baud recovery loop circuitry, for symbol timing extraction, as will be described in greater detail below.

Page 21, second paragraph, lines 13-22, amend to read as follows:

A4

While the square-root Nyquist filters 22 ordinarily assure that there is a minimal inter-symbol interference (ISI) over a perfect channel, the Nyquist filters are unable to remove ISI due to the imperfect channel characteristics. Accordingly, the dual mode QAM/VSB receiver according to the invention, provides an adaptive, multi-tap decision directed equalizer circuit 24, having 64 feedforward taps and 432 feedback taps, which is sufficient to remove ISI components generated by worst-case coaxial cable and terrestrial broadcast channels with multi-path spreads of up to 40 μ sec at 10.76 Mbaud.

Page 22, first paragraph, lines 3-17, amend to read as follows:

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The dual mode QAM/VSB receiver exemplified in FIG. 1 further includes a forward error correction (FEC) and decoder block 32, which is compatible with all common CATV standards and the ATSC terrestrial broadcast standard. Specifically, the Annex A/C decoder circuitry implements four general functions, frame synchronization, convolutional deinterleaving, Reed-Solomon error correction and derandomization. Hard decisions are input to the frame synchronizer which locks onto the inverted synch byte pattern, conventionally provided in television data frames. After synchronization, data interleaving is removed by a convolutional deinterleaver utilizing a Ramsey type III approach. Data symbols are next provided to a Reed-Solomon decoder, which is able to correct up to 8 symbol errors per RS block, followed by data derandomization to undo the corresponding randomization operation of the transmitter's modulator.

Page 25, last paragraph, lines 32-35 through page 26, lines 3-10, amend to read as follows:

AS
The dual mode QAM/VSB receiver in accordance with the invention is capable of operating on transmitted signals modulated by any of the above modulation formats with substantially the same circuitry. Particularly, and where appropriate, the receiver treats VSB modulated signals as though they were OQAM because of the frequency shift relationship therebetween. Where signals are required to be treated as VSB signals, processing blocks include a real to imaginary converter circuit, in particular a Hilbert transform filter, which creates an analogue Q rail signal from the VSB real I rail, in order to use complex circuitry which directly extracts an error vector quantity.

Page 29, first paragraph, lines 3-17, amend to read as follows:

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It will thus be understood that there are two stages to carrier acquisition, a first stage, termed "an outside stage" (or outside loop) provides for mixing the received digitized spectrum down to baseband and which might properly be termed "a tracking loop", and a second correction stage, termed "an inside loop", which functions more as an acquisition loop and which provides a correction factor to the spectrum to make sure the spectrum is properly centered. In addition, the correction factor is "leaked" from the inside loop to the outside loop in order that the inside loop might be constructed with a wide bandwidth, typically in the 100 kHz range in order to provide for fast acquisition. Correction factors are